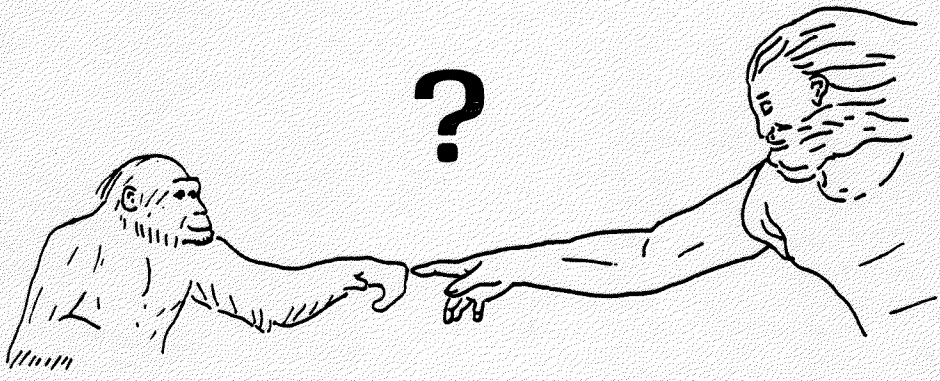
Creation / Evolution



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Dear Reader,

Welcome to the first issue of a new journal dealing specifically with the creation/evolution controversy. Our aim will be to answer in simple but correct language all the significant arguments creationists usually put forth in their publications and debates. We also will be reviewing the tremendous array of evidence available supporting the modern theory of evolution.

Until now, no such journal or general source of information existed on this question. This means that for all this time those opposing the reintroduction of Biblical fundamentalism into public education have fought the battle alone without any research support behind them. Each one had to start at the beginning with his research and preparation. Each had to learn the hard way the debate and instructional tactics of contemporary creationists.

This explains why it is that creationists today can often run circles around the people they debate. They are organized, their opposition is not. They work together and pool persuasive sounding arguments. Often the people they debate are academics expert in a narrow specialty but ill prepared for the barrage of issues thrown against them. These academics are also often unfamiliar with the objectives of creationists in debate. The creationists on the other hand are well armed with polished rebuttals and quotes from the evolutionary literature. In the end sound science, poorly articulated, loses out to well-packaged pseudo-science.

This is not to criticize those in the academic community. They are often too busy doing important work to spend valuable time reading the materials put out by these "scientific" creationists. They also don't have time to become generalists or "Renaissance men" so they can be ready for attacks on every front.

But there is a solution. People who do take the time to study the creationist arguments and research the clear and persuasive answers can share their work with others in this battle. Evolutionists can work together and pool their efforts just as the creationists do. This is exactly what has been started here in San Diego. There is now a network of contributors, advisors, and debaters from around the country expressing themselves in this journal.

We hope you'll join us.

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YES, VIRGINIA, THERE *IS* A CREATION MODEL

by Frank Awbrey

Though creationists carefully avoid stating their model in debates, thereby keeping themselves off the defensive, they have one nonetheless. Here it is in bold outline as extracted from their books and publications.

I. The Creation
  A. Accomplished by a supernatural being.
  B. Everything created from nothing relatively recently.
  C. The Earth was perfectly designed for life:
    1. Protected by a vapor layer:
      a. Uniform warm climate
      b. Cosmic radiation could not penetrate
    2. No wind or rain.
    3. The land irrigated by water from underground.
  D. All kinds created separately:
    1. Each kind is unique and fixed.
    2. Each kind is genetically highly variable.
  E. Humans were uniquely created.
  F. No decay occurred.

II. The Fall
  A. The Second Law of Thermodynamics invoked:
    1. Perfect order began to degenerate.
    2. Death, decay, and disorder began.
  B. People began to populate the Earth.
    1. All humans descended from the original couple.
  C. The vapor barrier enabled great longevity.

III. The Flood
  A. Simultaneous, worldwide cataclysm.
  B. All land was covered within 40 days.
  C. Flood water had two sources:
    1. The vapor barrier.
    2. Underground reservoirs.
  D. The Flood began 1656 years after creation.
  E. The Flood formed and deposited the geologic column.
  F. The Flood split the land mass into the present continents.
  G. The only survivors were aboard one boat:
    1. 8 humans.
    2. One pair of most kinds of animals.
    3. Aboard boat for 371 days.

IV. The Post Flood Period
  A. Left over flood energy caused the ice ages.
  B. Flood survivors repopulated the Earth.
  C. All living species are descendants of the survivors:
    1. They were modified by horizontal change to fill the Earth.
    2. The animals had original genetic variability.
  D. The vapor barrier was destroyed — longevity decreased.
  E. All species degenerate since disorder *must* increase.
  F. Present geological processes are different from those of the Flood.

Dr. Awbrey is a professor of biology at San Diego State University. He and his colleague William Thwaites teach a special course, Evolution and Creation — Contrasting the Two Models. *They present the evidence for evolution in half the course time, and prominent creationists use the other half.*

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WHY CREATIONISM SHOULD NOT BE TAUGHT AS SCIENCE

by Frederick Edwords

PART 1. The Legal Issues

The legal objections to placing Special Creation doctrines in the science classroom form what, quite frankly, can only be called an air-tight case. For once one understands the history of what Biblical creationists have been trying to do, once one grasps the full significance of their new tactic, and once one is aware of the nature of their latest legal moves, no choice is left but to acknowledge that the creationist's aims can never be legal under our present constitution. Let us, then, explore the history, tactics, and legal efforts of the creationist movement so as to better understand why it has never won a constitutional battle.

A History of the Legal Conflict

Large scale challenges to the teaching of evolution by creationists have occurred on three significant occasions in the last century and a half. The first was after the publication of Darwin's *Origin of Species*, the second was at the time of the Scopes trial, and the third is taking place today. On each occasion, creationists have attacked those in the scientific and educational community desiring to teach evolution.

Looking back on the first battle, Andrew White, in his 1896 book, *A History of the Warfare of Science with Theology in Christendom*, recalled that, "Darwin's *Origin of Species* had come into the theological world like a plough into an ant hill. Everywhere those thus rudely awakened from their old comfort and repose had swarmed forth angry and confused. Reviews, sermons, books light and heavy, came flying at the new thinker from all sides."

Specifically, one English clergyman, who was vice president of a Protestant institute to combat "dangerous" science, had denounced Darwinism as "an attempt to dethrone God." Another creationist, Whewell, succeeded in preventing a copy of the *Origin* from being placed in the Trinity College Library. Rougemont had called for a crusade against evolution in Switzerland. And a similar crusade had almost taken place among the scientific community in America until Asa Gray, the foremost American botanist, won it over in a series of stunning public debates at Harvard that defeated the anti-evolution movement for a time.

But a dozen years later it flared up again with Darwin's *Descent of Man*.

Fred Edwords has lectured and debated widely on the creation/evolution question, has designed a two-model slide show on the subject, is Editor of this journal, and is Administrator of the American Humanist Association.

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In England, Gladstone condemned it. In America the Reverend Dr. Hodge of Princeton declared that Christians "have a right to protest against the arraying of probabilities against the clear evidence of the scriptures."

However, the problem of the teaching of evolution in the *public* schools was not yet an issue. No. In those days the issue was the teaching of science in *any* form to children. Huxley had his hands full in England just trying to lay to rest the old classical and theological education so as to make room for such "liberal" studies as science, geography, history, grammar, composition, drawing, and physical education.

This meant that it wasn't until the decade of the Scopes trial that teaching children about evolution became an issue. And it became an issue largely because its teaching had finally become frequent enough to alarm the conservative American religious community. So, once again the anti-evolutionists formed their battle lines, thereby setting off the second great conflict.

Between 1922 and 1929, forty-six pieces of legislation aimed at preventing the teaching of evolution were introduced. Of these, only three were passed, all of which were later declared unconstitutional.

Writing in 1927 in the *Bulletin of the American Association of University Professors*, S.J. Holmes said that "the worst feature of the situation is not so much the intellectual backwardness revealed by the passage of these statutes as the spirit of religious intolerance and disregard of intellectual liberty which prompted their enactment."

Many feel it was this sentiment, becoming widely held, that brought an end to the legislative attacks by fundamentalists. Yet nothing could be further from the truth.

The only real reason the attacks came to an end was because evolutionists made a compromising retreat. As Mayer (1978) points out, "In most American schoolbooks the word *evolution* simply disappeared." Many times this was done as a mere camouflage maneuver, evolution still being taught under different names like "change through time" or "heredity." But at other times it was done in an apparent recognition of defeat.

As Bette Chambers (1977) noted when president of the American Humanist Association, "Years ago we were made painfully aware that this intricate and beautiful principle of modern biology is taught almost nowhere without extensive apologetics or having first been filtered through a sieve of nervous religious disclaimers." She was describing the case of her own daughter who, in 1965, had come home angrily from junior high school after seeing a Moody Bible Institute nature film in her science class. "*Must* I believe that the spider makes the web perfectly the very first time she tries because God has 'programmed' her brain like a computer?" she cried.

So, even though the legislative track record of creationists was poor, they had an impressive long-term success in convincing teachers and publishers to soft-pedal evolution (Cowen, 1979). That is, they managed to set up an

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environment where evolution was "selected out" of text books by a "slow and gradual process" which went almost unnoticed. No wonder only one piece of legislation attempting to prohibit the teaching of evolution was introduced in the 33 years between 1930 and 1963.

But this couldn't go on forever, not with evolutionary science developing by leaps and bounds. Sooner or later the scientific and academic community would have to wake up to the fact that only a shadow of evolution, if any at all, was being presented in the public schools. And to help bring about this awakening, biologist Hermann J. Muller, on the centennial of Darwin's *Origin*, wrote an article entitled "One Hundred Years Without Darwin Are Enough."

When the drive finally got underway to bring evolution back into the classroom, it seemed the public would be receptive. Russian advances in the space race had parents and school boards calling for more science education. So, in 1964, biology textbooks sponsored by the National Science Foundation went into use with government funding. These textbooks reintroduced evolution and, as a consequence, also reintroduced the creation/evolution controversy.

This time, however, the religious conservatives were not so blunt as to reject all science, or even to reject evolution alone. The new ploy was to appeal to "fairness," and thereby demand "equal time" for creationism. As a result, at least twenty-five pieces of legislation relating to the "equal time" idea have been proposed since 1964. At present, more than 20 states have policies allowing local school districts to include creationism as an alternative. Ellen Goodman reports in her newspaper column that "In 27 states, textbook selection committees are under pressure to accept books which teach Divine Creation — not as theology, but as biology."

And it hasn't stopped there. With the creationists gaining momentum and putting forth ever more sophisticated legal arguments (they at first wanted equal time for Genesis, but now usually seek it for "creation science"), they have burst forth in a new wave that is beginning to blanket the nation.

So far, three pieces of "equal time" oriented legislation have passed, one of which has already been declared unconstitutional. The real threat, however, has come from the creationist influence on individual school boards to either allow or require their "two-model" teaching program. A large number of local school boards in a variety of states have been persuaded that equal time for creationism is both fair and legal.

The New Tactic

Obviously the creationists have learned a lot in their long struggle to unseat evolution. Trial and error has shown them what doesn't work: Anti-science doesn't, efforts to ban evolution don't, and purely religious invective is also a losing proposition. The idea of being open-minded, religiously neutral, and scientific has gained such wide credence (or at least lip-service) that creationists

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can't successfully oppose it, no matter how much they might like to.

So, their new tactic is to declare creationism scientific, then join in with the majority and espouse the virtues of the times in their own name. In this way they can pose as latter-day Galileos being persecuted by "orthodox" science. They can become the champions for fairness fighting against the "dogmatic" evolutionists who have hauled them into the "Scopes trial in reverse." In fact, they can even declare themselves Jeffersonian fighters for church-state separation against "the religion of evolutionary humanism" in the public schools, as well as revolutionaries for progress bringing new truths into play against "the establishment."

How have the creationists accomplished this? With one simple sentence. Dr. Henry Morris of the Institute for Creation Research probably deserves the credit for it. In his debates he simply says, "Creation is just as much a science as is evolution, and evolution is just as much a religion as is creation."

Such a statement serves three purposes at once. First, it declares creationism to be an alternate scientific theory to evolution. Second, it criticizes evolution for being a belief held only on faith. And third, it confuses school boards and legislatures.

To back up this statement, Morris throws in a variety of scientific-sounding arguments and legalistic appeals for "equal time" and "church-state separation." The effect of this on his average audience is one of producing doubt. And in the face of such doubt, these people begin to think, "Since I can't tell who is right, it's only reasonable to let both views be taught."And so it happens: through clever word manipulation and appeals to "equal opportunity," the creationists win the day.

When objections are raised, however, the first one is invariably that creationism is derived from the Bible, that the Bible is a religious book, that it is unconstitutional to mandate teaching sectarian religion in the public school science curriculum, and therefore creationism should not be introduced.

The creationists, however, have a ready answer. The two-model approach, they declare, "is *not* the introduction of the Bible or Bible stories about creation into the science books or classrooms." (Creation-Science Research Center, 1980.) "It is the fair and balanced presentation of the evidence and arguments both pro and con relative to both models of origins . . ."

In addition to this ready answer, they also have ready-made textbooks. Probably the most famous is Dr. Morris' *Scientific Creationism*, put out by his Institute for Creation Research. The preface states "*Scientific Creationism* (Public School Edition) . . . deals with all the important aspects of the creation/evolution question from a strictly scientific point of view, attempting to evaluate the physical evidence from the relevant scientific fields without reference to the Bible or other religious literature."

However, in spite of this nice-sounding opener, this textbook is nothing more than a polemical attack on the evidences for evolution, with almost no

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statement of the case for creationism or the nature of the creation model. Such a ploy is necessary since, outside the Bible, there *is* no creation model. This is readily proved by Dr. Morris' revealing statement, "The Bible account of creation can be taught in the public schools if only the scientific aspects of creationism are taught, keeping the Bible and religion out of it altogether." This seems to mean that Biblical ideas suddenly become scientific once one hides the fact that the Bible is the source.

So, hide the Bible they do. For example, in another anti-evolution book entitled *Evolution: The Fossils Say No!*, Dr. Morris' colleague, Dr. Gish, writes, "By creation we mean the bringing into being of the basic kinds of plants and animals by the process of sudden, or fiat, creation described in the first two chapters of Genesis." This seems plain enough. But Dr. Gish wanted his book used in the public schools. So, what did he do? He wrote a revision of it that left out this reference to his ultimate authority.

Perhaps he had learned something from the recent experiences of John N. Moore and Harold Slusher, two other creationists. They co-edited the controversial high school science textbook *Biology, A Search for Order in Complexity.* Although this book was purported to be objective, scientific, and non-sectarian, an Indiana Superior Court found it riddled with religious references such as: " . . . the second law (increasing entrophy) is essentially a confirmation of the universal law of decay and death postulated in accordance with the biblical version of the creation model." " . . . most fossil material was laid down by the flood in Noah's time." " . . . the most reasonable explanation for the actual facts of biology as they are known scientifically is that of biblical creationism."

The court's verdict, issued by Judge Michael T. Dugan II, was probably the most embarrassing judicial expose of modern-day creationism ever handed down from the bench. The Court declared, "Clearly, the purpose of *A Search for Order in Complexity* is the promotion and inclusion of fundamentalist Christian doctrine in the public schools. The publishers, themselves, admit that this text is designed to find its way into the public schools to *stress* Biblical Creationism. . . . The question is whether a text obviously designed to present *only* the view of Biblical Creationism in a favorable light is constitutionally acceptable in the public schools of Indiana. Two hundred years of constitutional government demand that the answer be *no*. The asserted object of the text to present a balanced or neutral argument is a sham that breaches that 'wall of separation' between church and state voiced by Thomas Jefferson. Any doubt of the text's fairness is dispelled by the demand for 'correct' Christian answers demanded by the *Teacher's Guide.* The prospect of biology teachers and students alike, forced to answer and respond to continued demand for 'correct' fundamentalist Christian doctrines, has no place in the public schools."

As one watches creationists, one can see that they learn their lessons very well. *Scientific Creationism*, though it mentions a worldwide flood that occurred less than 10,000 years ago, the "survivors" of which "emerged" "near the site of

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Mount Ararat," and though it refers to a miraculous origin of languages "near Babylon" " . . . where tradition indicates the confusion of languages took place," it never mentions the Bible.

At least it never mentions the Bible in the "Public School Edition." The "General Edition," however, is quite another story. It is "essentially identical with the public school edition, except for the addition of a comprehensive chapter which places the scientific evidence in its proper Biblical and theological context," says the Foreword. This version is for the *Christian* schools.

In their public debates, the creationists are even more careful to avoid stating their creation model. They invariably start out by saying that what they're talking about has nothing to do with Genesis. After that, the rest of their material is evolutionary criticism. If their opponents try to bring up the Bible, they counter-attack by declaring they came to talk about *science*, not religion. They further add that they have a right to their religious faith and should not have to hear criticism of it during a discussion of the scientific issues.

This approach seems to do well for them most of the time. But constant demands by evolutionists for creationists to explicitly state their model has lately forced them to formulate a secularized version of what they really believe. This version, contrived by attorney Wendell R. Bird, was published for all the world to see in the December 1978 issue of *Acts & Facts*, put out by the Institute for Creation Research.

Clearly, Bird felt it was important to carefully define the differences between the Biblical creation and *scientific* creation models. It was and is his view that a sharp and consistent distinction can be made. *Acts & Facts* declared, "The scientific creation model is based on scientific evidence, and the Biblical creation model is based on Genesis and other Biblical revelations. Mixing presentation of the scientific creation model and supporting scientific evidence with references to the Bible, Genesis, Adam, Noah, or the Ark will cause scientific creationism to be barred from the public schools."

It would seem by all this that the differences between the two models must be quite radical. Are they? You can find out for yourself by comparing them side-by-side as is done in the box on the next page. No doubt you'll notice that the actual differences between the "scientific" and Biblical creation models are quite small, in some places only amounting to a change of two or three words.

As I pointed out rather bluntly to Dr. Kofahl, a leading creationist, during a recent debate in which we both participated, "The differences between the Biblical model and the science model are so minor, so minute, that nobody is kidding anyone and nobody is being fooled. Once you hear the creationist model laid out, you're going to recognize it immediately as a Biblical model unless you were born in Borneo somewhere and never heard of the Bible."

In response, Dr. Kofahl argued that this wasn't the creationism he was interested in, and that he had no desire to bring Dr. Morris' *Scientific Creationism* into the classroom. What he wanted to see was "the evolution model criti-

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cized on the basis of the scientific evidence."

Well, there we have it again. They don't want to talk about their own model. They only want to critique evolution. This is the only *real* way they can avoid the problem of bringing in the Bible, and they know it.

And yet, when they get careless, they *do* bring it in. The Creation-Science Research Center, of which Dr. Kofahl is a representative, publishes the *Science and Creation Series*, which is a set of graded public school textbooks. This set was examined by Richard M. Lemmon for the California State Board of Education in 1975. In his report he drew attention to a number of religious references in the series.

He wrote, "In the 'Handbook for Teachers', page 75, it is stated that 'It is known that the nation of Israel began about 3700 years ago with the patriarch

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THE TWO CREATION MODELS OF WENDELL R. BIRD

As Taken From the December 1978 Issue of *Acts & Facts*

Scientific Creation Model:

I. Special creation of the universe and earth (by a Creator), on the basis of scientific evidence.

II. Application of the entropy law to produce deterioration in the earth and life, on the basis of scientific evidence.

III. Special creation of life (by a Creator), on the basis of scientific evidence.

IV. Fixity of original plant and animal kinds, on the basis of scientific evidence.

V. Distinct ancestry of man and apes, on the basis of scientific evidence.

VI. Explanation of much of the earth's geology by a worldwide deluge, on the basis of scientific evidence.

VII. Relatively recent origin of the earth and living kinds (in comparison with several billion years), on the basis of scientific evidence.

Biblical Creation Model:

I. Divine creation of the heaven, stars, and earth by God, on the basis of Genesis.

II. Application of the curse, pronounced by God after Adam's fall, to produce deterioration in the earth and life, on the basis of Genesis.

III. Divine creation of plant and animal life, Adam the first man, and Eve from Adam's side by God, on the basis of Genesis.

IV. Fixity of original plant and animal kinds, determined by God, on the basis of Genesis.

V. Distinct ancestry of Adam and apes, on the basis of Genesis.

VI. Explanation of the earth's geology by a world-wide flood in which only Noah, his family, and animal pairs were preserved in an ark, on the basis of Genesis.

VII. Approximately six thousand year time span since creation of the earth, life, and Adam, on the basis of Genesis.

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Jacob.' . . . In 'The World of Long Ago, 3T', page 29, it is stated that 'The Bible also records a great flood, one that covered the highest mountains.' . . . In 'Man and His World, 7T', page 11, we find that a French explorer 'found timber which he believes came from the Ark of Noah.' . . . In 'Beginning of the World, 7T', page 5, there is a reference to 'one eternal personal God as the Creator of all things (as in Genesis).' . . . In the 'Handbook for Teachers', page 77, we find a statement about the ' . . . great world catastrophes occurring after the creation, including especially the great flood recorded in the book of Genesis. . .' "

On the basis of these and other discoveries, Lemmon argued that "The entire purpose of these books is to use science classes to indoctrinate students in a particularly narrow brand of religious sectarianism. That sectarianism ignores most of the world's great religions; its promulgation in the public schools would violate the Education Code, Article 2, Section 9014, and the California State Constitution, Article IX, Section 8."

The New Legal Moves

From the foregoing, it would seem the creationists have been rather clumsy in sticking to their new tactic of secularizing creationism. But, even if they had managed to carry off such a plan with any efficiency, their position would still fall short of legal acceptability.

There are a number of reasons for this; but to understand them correctly, it will be necessary to first reveal what the creationists are trying to do with their new "scientific creationism" now that they have formulated its rhetoric.

In a September 1977 letter of appeal for contributions, Dr. Morris wrote, "As you know, one of our main purposes here at ICR has been to reach the schools and colleges of our nation with the message of creation, so that young people would know there is a valid alternative to the evolutionary humanism that dominates our society today." In October he added, "We especially appreciate the splendid efforts of so many of you to accomplish the goal of getting creation into your own local schools and colleges."

Nell Segraves, Administrative Assistant of the Creation-Science Research Center, and one of the founders of the modern creationist movement, stated in a recent letter to Frank Mortyn of San Diego Mesa College that, "we are advocating the introduction into science textbooks and classrooms of scientific data which support the alternative explanation of origins, namely, intelligent purposeful design and special creation. In other words, we are calling for a reform in the teaching of science."

Segraves authored the Center's "action Manual," a guide for implementing Creation-science curricula in the public schools, the legal rationale for teaching it, and guides for evaluating textbooks. In a recent debate she declared, "We feel that we are entitled to at least 50 percent of the public education system for our point of view."

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Her reasoning is simple and straightforward: The Scopes trial, in showing the illegality of banning evolution, also showed the illegality of banning *any* theory of origins. Since creationism is such a theory, then by the logic of the Scopes trial, it cannot be banned either.

When confronted with the argument that creationism has definite religious overtones, she responds by claiming that the same is true for evolution. It is "the religion of secular humanism" in the public schools. This means that any school that teaches evolution without balancing it with special creation is operating contrary to the religious neutrality requirement of the U.S. Constitution. It is setting up a state religion in the science classroom.

These are her arguments; and on the basis of these, the Creation-Science Research Center is seeking to cut off millions of dollars in federal funds that come into California. Since the state-supported schools don't teach both theories of origins as science, it is claimed the schools are religiously biased and therefore undeserving of the monies.

CSRC is also suing the state of California for setting up textbook guidelines that leave out special creation. CSRC wants to prevent the guidelines from going into effect and has attempted to get a mandatory court order forcing the state to allow teachers to consider creationism in science courses.

Other creationist groups go further, however, and try to pass legislation that not only will *allow* creation to be taught, but will *require* it. The recent battle in Georgia in March of this year was one such example. The joint houses of the state legislature came very close to passing a bill that would have required equal time for creation any time the issue of origins came up.

In the same month, the Florida House Education Committee voted 7 to 6 for a similar bill. An editorial in the St. Petersburg *Times* declared:

"This bill would not prohibit the teaching of evolution, at least not in so many words. But any school that undertook to acknowledge the theory of evolution — whether in class or merely on its library shelves — would have to give 'balanced treatment' to what is called 'the theory of scientific creationism.'

"And what is that? The bill defines it with a lot of gibberish and mumbo-jumbo, all of which boils down to this: The biblical account of creation can be proven literally, with scientific 'evidence.' . . .

"IN PRACTICE, the bill would simply end the teaching of evolution — and perhaps all science — because few teachers and school boards would consent to teach the alternative theories the bill espouses."

And this may be something creationists would like to see. The April 1979 *Acts & Facts* stated: "We are not trying to exclude evolution from public schools, unless creation is also excluded." Nell Segraves put it more plainly in debate: "It's totally unnecessary to bring origins into a science discussion. Textbooks today can give good science without discussing philosophy of origins at all." Dr. Kofahl, in the same debate, then immediately added, "We would really be satisfied to see the subject of origins removed entirely from public

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school science . . . Let's *forget* about origins. Let's put *all* origins discussions into the philosophy department."

In Medford, Oregon, it seems creationists easily got their wish. When a young student of "scientific creationism" started stumping for equal time, the Medford School Superintendent, Richard Langton, declared the following:

"Evolution is not taught in any of the schools of District 549C [Medford]; neither is creation for that matter. Down through the years, educators have learned that this is such a controversial subject that it is far better not to deal with it at all than to try to deal with it, even on a fair basis, pointing out the claims of both sides. At appropriate levels, where it is understood, we do teach simple genetics, but we in no way get into the question of the evolution of man."

We can now see the entire creationist legal program in all its glory. First they stump for equal time on the grounds that creationism is an alternate scientific view. When that fails, they argue for equal time on the grounds that creationism is an excluded *religion*. When that fails, they say that *neither* should be taught because both are *philosophies*. And by the time that fails, the school officials are so intimidated they begin to wish they had never even heard of evolution.

Still, however, the creationists have one more legal gambit up their sleeves. Nell Segraves probably deserves all the credit for it. Her argument runs thusly:

The atheists have won a number of significant court cases that have resulted in the removal from the public schools of everything offensive to their atheistic viewpoint. They have gotten rid of prayers, religious references in text books, religious displays, etc. Women's rightists have also had much success in removing things that offend them, such as sexist language in textbooks. Well, now it's time for Christian fundamentalists to use these *same* court decisions in *their* favor — that is, to remove everything offensive to the *Christian fundamentalist* viewpoint. " . . . *we* now are on the outside demanding equal treatment and equal recognition for our point of view under the First and Fourteenth Amendments of the U.S. Constitution and the Civil Rights Act of 1964," she argues.

Such an interpretation of the relevant court decisions has far-reaching implications, and the Creation-Science Research Center reaches most of them. They aren't satisfied with calling only *evolution* "offensive," but go on to add sex education to the list. They further object to the teaching in history classes of the theory that human societies evolved from tribe to village to cradle of civilization. (They believe that man was civilized when he came off the Ark.)

In the general public sector they use the same arguments to condemn rehabilitation of criminals, abortion, government grants to Planned Parenthood, and research grants to behaviorists. In their January, 1980 *Creation-Science Report* they make their position very plain: "As theists and creationists, possessing equal rights and privileges under the Constitution and Federal Civil Rights

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legislation, we can set forth creationist position papers on any and *all* problems affecting public morals or health, domestic or foreign policy, whenever government funding is required." This is why seeking cutoffs of funds is one of their major tactics.

One can only ask, in the face of this line of reasoning, where it will stop. Obviously, there is *no* view taught in our schools that at least *somebody* won't find offensive to their religion or value system. The teaching of physical science in any form is offensive to mystics who hold that matter is an illusion. If the school nurse talks about health, she had better not mention medicine or vaccinations, or it will offend the followers of Christian Science. Teaching English is bound to be an offense to those who uphold the sacred languages of Hebrew or Sanskrit. Any geography or astronomy which declares the world to be round will create problems in the homes of religious children who were raised by Bible-believing flat earthers.

So, we must ask the practical and legal question: how far must the schools go to avoid offending someone's religion, and how far must they go in giving balanced presentations of all viewpoints every time an "offensive" issue is raised? Furthermore, what state and federal programs will have to be cut off because someone comes up with a religious reason for not liking them? Would we have any government programs or modern education left?

Two creationist women I met during a lecture in Seattle had a simple solution. Get rid of public schools altogether. Let parents choose what kind of schooling they want their children to have. In fact, let them opt for no schooling at all, if they so desire.

The Legal Case Against Creationism

In recent months, bills promoting "equal time" have been introduced in 15 states. The Creation-Science Research Center has volunteers working on legislators and school officials, to get them to reform the science curricula, in 37 states. All in all, it appears the creationist legal movement is operating at full tilt.

Some of the creationists promoting such action probably think they can win, that the law is on their side. But many others know better, like Senator Hugh Carter, who, in speaking for Georgia's recent creation bill, declared cynically from the floor of the State Senate, " . . . look at all the good we can do between now and the time it is declared unconstitutional."

Those on both sides who have really looked into the matter can see hopeless flaws in the legal case for creationism. Right off the bat it starts out with a basic contradiction. First the creationists try to define science so narrowly that it leaves out evolution. This renders evolution a *religion*, right along with creation. Then they try to so broadly define the science *curriculum* that it allows both "religions" to be taught in a scientific context. Putting it another way, creationists demand equal time for creation on *religious* grounds,

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so they can get it into the schools, and then demand equal time on *science* grounds, so they can get science instructors to teach it! No case this absurd can be tried for long without trying the patience of everyone.

In the new legal battles, creationists will often deny they are trying to replay the Scopes trial. They don't want to ban evolution, they declare, they just want to make sure it won't be taught without creation having a place too. But the idea that evolution is OK only if creation is included is really two ideas in one. First, it is the idea that when evolution is taught, creation is *mandated*. Second, it is the idea that if creation is *not* taught, evolution is *banned*. The two must be dealt with separately. Let's begin with the second.

The banning of evolution on religious grounds has the unenviable legal status of being totally unconstitutional. In the case of *Epperson v. Arkansas* in 1968, the U.S. Supreme Court held that no religious group had the right to blot out any public school teaching just because it was "deemed to conflict with a particular religious doctrine." For to do so would be to, in effect, establish a religion, or at least a religion's prohibitions, in the public sector. This is contrary to the First Amendment of the U.S. Constitution which reads in part: "Congress shall make no law respecting an establishment of religion or prohibiting the free exercise thereof; . . . "

And it doesn't seem to matter if the anti-evolution law is stridently religious, or is vague on the matter, it is unconstitutional all the same. For example, the Tennessee law which John Scopes was charged with breaking, made it unlawful "to teach any theory that denies the story of Divine Creation of man as taught in the Bible and to teach that man has descended from a lower order of animals." But the Arkansas law challenged in *Epperson v. Arkansas* was less explicit. Both were declared unconstitutional. The Court declared in *Epperson* that it was "clear that fundamentalist sectarian conviction was and is the law's reason for existence." It was noted that "Arkansas did not seek to excise from the curricula of its schools and universities all discussion of the origin of man. The law's effort was confined to an attempt to blot out a particular theory because of its supposed conflict with the Biblical account, literally read." Recent legal moves, though more camouflaged than ever, seem to come to the same thing. The creationists are trying to remove evolution on religious grounds.

It would seem strange, in the light of the *Epperson* decision, that creationists wouldn't move to do what the Court seemed to allow, that is, remove *all* teachings of origins. But I doubt if that is their first preference. They would probably prefer to find a way to teach special creation (or, more correctly, Biblical fundamentalism). And it isn't likely they would be satisfied to have it taught in comparative religion classes either. Why? Because the science classes will continue to teach things creationists regard as persuasive in the "wrong" direction, things that would be devastating to their belief system if true. So, they want to get religion into the science classes also. When they can't ban evolution and teach creation, they usually strive to *require* creation and *neutralize* evolu-

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tion. Teaching neither, then, is hardly satisfactory to them. This is probably why they don't really push for that except as a footnote to their bills and lawsuits, as an afterthought in their debates. (The aforementioned announcement by the Medford, Oregon School Superintendent that evolution was not being taught did not put an end to the creationist movement there.) So, let's look into this idea of *requiring* creationism.

Obviously, if banning a teaching in the schools on religious grounds constitutes the establishment of religion in the public sector, then it is all the more true that *requiring a religious doctrine* in the schools is to do the same thing! Yet creationists somehow think they can do better with this idea than with the previous one.

True, appeals for "equal time," "fair play," and "academic freedom" are more persuasive with the public. But it isn't the public who decides constitutionality. That operates according to a basic *principle*, one that is to be unchanging, for the most part.

But even if the doctrine being required wasn't religious, it would still be questionable. As Professor Richard D. Alexander noted in the February 1978 *American Biology Teacher*, "If evolutionists were attempting to require that evolution be taught it would be no less pernicious. . . . when anyone attempts to establish laws or rules requiring that certain theories be taught or not be taught, he or she invites us to take a step toward totalitarianism. Whether a law is to prevent the teaching of a theory or to require it is immaterial. It does not matter if equal time is being demanded or something called 'reasonable' time, because there can be no reasonable time in such a law."

In the past when a scientific view was mandated by government, it resulted in disaster and a stiffling of progress. One particular example occurred 40 years ago in Russia. A man named Lysenko temporarily established that Lamarkian evolution was true science and that Darwin was wrong. This resulted in, first, a mandating of Lamarkianism. But following shortly on its heels was a banning of Darwinism. It took decades for Russia to recover from this legal action and catch up to the modern world in the realm of science.

In the recent Georgia battle, Julian Bond, a black State Senator, expressed the point in this way. "Thirteen years ago, I sponsored a bill that called for the teaching of black history in the public schools. Everybody said, 'It's a fine idea, but we can't legislate the curriculum.' What will we tell the large body of non-Christian children who sit in Georgia's classrooms and are taught the creation theory?"

In the Georgia State *Legislature*, Representative Billy McKinney argued much the same way. He noted that if government was now going to enter the business of curriculum design, it should demand equal time for black history. After all, "There are more black folks in this country now than there are scientific creationists."

The *Epperson* decision, while dealing with a law banning evolution, had

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something to say about requiring creation as well. The Court declared, "There is and can be no doubt that the First Amendment does not permit the State to require that teaching and learning must be tailored to the principles or prohibitions of any religious sect or dogma. . . . the State may not adopt programs or practices in its public schools or colleges which 'aid or oppose' any religion. . . . This prohibition is absolute. It forbids alike the preference of a religious doctrine or the prohibition of theory which is deemed antagonistic to a particular dogma."

In *Zorach v. Clauson* in 1951, Justice Douglas wrote the majority opinion, saying: "Government may not finance religious groups nor undertake religious instruction nor use secular institutions to force one or some religion on any person." The comment about *financing* religious groups is instructive, because the teaching of creation would require the use of creationist textbooks and learning materials. Since only religious creationists offer them, then to make such purchases could easily amount to the financing of religion by government.

In California, religious ideas may be discussed in the schools, provided they "do not constitute instruction in religious principles or aid to any religious sect, church, creed, or sectarian purpose . . . " (Younger, 1975.) In view of recent cases, it is clear the courts would rule that the teaching of special creation would do at least one of these things. There can be no doubt that creationism is a religious doctrine, even the "scientific" version, and that the courts would discover this fact.

As for the question of whether evolution is *also* a religion, Evelle Younger, Attorney General for California, had this to say to the Creation-Science Research Center in 1975:

> The "neutrality requirements" of the First Amendment are not violated by the inclusion in textbooks by the State Board of Education of a scientific treatment of evolution. The degree to which a scientific subject should be made more or less "dogmatic" does not involve considerations of "religion." Such considerations, in the exercise of the Board's sound discretion, turn upon the degree of scientific certainty supporting a subject presented in a textbook. Action by the State Board of Education or local boards of education to modify a scientific theory may be judicially proscribed if it can be demonstrated that it is an attempt to modify such theory because of its supposed conflict with religion.

The issue Younger was commenting upon was the Creation-Science Research Center's efforts to have evolution taught in a less "dogmatic" way in California schools and textbooks. His arguments indicate that not only can evolution not be banned or "balanced," but it also cannot be modified (at least not unless the scientific facts, as determined by the State Board of Education, warrant such modification independent of religious criteria).

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As for Nell Segraves' argument that prayers in school were removed because they were an "offense" to atheism: this is nothing but more creationist revisionist history. The reason prayers were removed was because they constituted an establishment of sectarian religion in the public sector (Swancara, 1950). This means Mrs. Segraves can gain no legal advantage by claiming evolution is a religious "offense" to creationism.

And if she tries to point to civil rights legislation that bars "offenses" to blacks, women, etc., her argument will still miss the point. The civil rights laws ban disparaging remarks, not courses of study. Therefore, if blacks are depicted as lazy, women as emotional, or Christians as bigoted, *then* legal action will be taken. But no one can, under these laws, either ban courses or *require "equal time"* for black studies, women's studies, or creationism.

It is true, however, that in the case of *West Virginia v. Barnette*, Justice Murphy wrote in his concurring opinion: "Official compulsion to affirm what is contrary to one's religious beliefs is the antithesis of freedom of worship. . . ." But this only applied to the compelling of unconscionable statements. Evolution, as normally taught, does not require the student's allegiance. Only his or her understanding of the objectively presented concepts is sought. Therefore, the teaching of evolution is neither a threat to nor an imposition on the religious freedom of any child. Students are always free to disagree with any theory they learn.

In the case of *Wisconsin v. Yoder*, the Court granted Amish parents the right to take their children out of the public schools after eighth grade, provided those children were participating in the "long established program of informal vocational education" that the Amish taught. The Court declared that "the values of parental direction of the religious upbringing and education of their children in their early and formative years have a high place in our society." A similar right of parents to send their children to private, religious schools was upheld in *Pierce v. Society of Sisters*, so long as the children were prepared "for additional obligation" in society.

All these cases, then, seem to offer a solution to parents like Mrs. Segraves. If they are "offended" by evolution, they can send their children to private religious schools, or, as in the case of sex education, have them released from the class when the subjects at issue are being taught.

Regarding this solution, creationist lawyer Wendell Bird rightly points out the unfairness of requiring an individual to make a choice between his faith and a public benefit. He has a right to both. Free education and free exercise of religion need not be mutually exclusive (Bird, 1978). Bird also criticizes the released time plan, citing the case of atheists who were not satisfied with merely having the right to leave the classroom during school prayers. Creationists, too, who in *their* situation might desire to leave evolution studies "would probably be prevented by pressure from fellow students, respect for teacher opinions, and need for other course material missed." (Bird, *Acts & Facts*, May 1979.)

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There may be something to Bird's argument that evolution serves to undermine faith in a literal interpretation of the Bible and is therefore a burden on a fundamentalist's rights to free exercise of religion. But this is hardly sufficient to justify forcing *all the rest* of the pupils to study creationist religious doctrines or to go without learning about evolution and thereby receive an inferior education. It would seem there is a state interest in teaching this material, and teaching it exclusively. This is made clear by the fact that evolution is the one great unifying principle of all science. Students cannot be adequately prepared for scientific careers if they are left in the dark about its existence. And if it is "balanced" with a non-scientific theory, then they will get an inaccurate picture of science and be misled into believing there is a significant split of opinion among scientists on the issue, when there is not.

Probably the best solution would be to set aside one science class wherein origins would not be discussed at all. This would be for conscientious objectors. Such a plan would effectively remove all "offense" and "burden on free exercise," while still leaving the rest of the students free to learn a *complete* science.

Creationist Guerrilla Warfare

Unlike the Creation-Science Research Center and other similar organizations, the Institute for Creation Research does not engage in law suits or legislation, at least not directly. In the January-February 1973 *Acts & Facts*, Dr. Morris wrote that "no recommendation is made for political or legal pressure to *force* the teaching of creationism in the schools. Some well-meaning people have tried this, and it may serve the purpose of generating publicity for the creationist movement. In general, however, such pressures are self-defeating. . . . The hatchet job accomplished on the fundamentalists by the news media and the educational establishment following the Scopes trial in 1925 is a type of what could happen, in the unlikely event that favorable legislation or court decisions could be obtained by this route."

The clear admission that creationism doesn't have a legal case is even more explicitly stated by Morris in a December 1974 article. He wrote: "Even if a favorable statute or court decision is obtained, it will probably be declared unconstitutional, especially if the legislation or injunction refers to the *Bible* account of creation."

Since Dr. Morris and ICR, then, clearly recognize the legal shakiness of their two-model position, what is their plan for getting creationism into the schools?

Well, they outline it in detail in a number of issues of *Acts & Facts*. Here are its salient points:

I. Parents should —
   1. Buy and read ICR creationist books, both religious and scientific.
   2. Teach their children and those of other parents about creationism, and

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encourage them to bring the issue up in the classroom.

3. Talk to the school teachers about it, and if they aren't receptive, go to the principal or superintendent.
4. Convince local school boards that the two-model approach is legal, non-religious, and in no way contrary to the U. S. Constitution.
5. Purchase copies of *Biology, A Search for Order in Complexity* and *Scientific Creationism* (Public School Edition) to show to school officials. Recommend the former for students, the latter for teachers.
6. Get permission and speak at the next state board of education meeting or meeting of the proper state curriculum authority.
7. Get permission and speak at the next state textbook commission meeting after seeing advance copies of the textbooks and reviewing them.
8. Petition that a resolution (not a law) be passed "permitting" or "encouraging" (not requiring) the teaching of creationism.
9. Establish a community pressure group with an appropriate name like "Citizens for Scientific Creationism" or "Civil Rights for Creationists." Then do things like take a community census poll, raise funds to buy the school and public libraries creationist books from ICR, promote a workshop on creationism for teachers or a seminar for the general public, sponsor debates using ICR experts, and/or work up a lot of media publicity in local and school papers, etc.
10. Donate money to ICR for further creation research.

II. School administrators should —

1. Encourage teachers to teach creationism.
2. Conduct workshops on creationism for teachers on a graduate credit basis, bringing in ICR experts.
3. Provide substitute teachers to teach creationism when the regular teacher isn't willing, or have regular specialists in the subject.
4. Have creationist materials purchased for the school(s).

III. Teachers should —

1. Introduce creationism into their own classrooms "no matter what the course subject or grade level may be. . . . whenever the textbook or course plan contains evolutionary teachings or implications." This not only includes science, but geography, history, social science, and other subjects.
2. Rent or order ICR two-model and creationist audio-visual aids.
3. Invite creationist speakers to address a school assembly.
4. Talk to fellow teachers over coffee and win them over to the two-model approach.

IV. Scientists should —

1. Stand firm to their creationist convictions when faced with the derision of their colleagues.

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2. Serve as consultants and lecturers for schools and citizen groups.
3. Join the Creation Research Society.

V. Pastors should —
1. Promote *Biblical* creationism in their church and Sunday school.
2. Lead community-wide creationist movements involving the churches.
3. Talk with school administrators.
4. Promote creationism over the airwaves.

VI. Students should —
1. Give "careful, courteous, consistent Christian testimony" to the teacher in a way that is "winsome and tactful, kind and patient."
2. Raise questions and offer alternative suggestions in class discussions.
3. Bring creationism into speeches, papers, and class projects.
4. Invite the teacher and classmates to creation seminars.
5. Suggest a creation/evolution debate in the classroom.
6. Give ICR tracts and publications to the teacher and principal.
7. Answer relevant test questions with the prefacing words "Evolutionists believe that — " when an evolutionary answer is required to get a test question correct.
8. Withdraw from the course if the teacher is too hostile.

Dr. Morris has said: "Creationist teachers are in a unique position to play a critical role in this strategic conflict," and he has his strategy all worked out. He notes further that pastors "are especially capable at the arts of persuasion and instruction" and should use these to promote the cause. "Scientists and other professionals who are Christians have a peculiar trust from the Lord." (*Acts & Facts*, December 1974.) The aim here is obviously to bring as much pressure to bear as possible in order to "bring creation back into the public schools."

Sample resolutions for presentation before school boards and state curriculum authorities have been published for easy use in both the July-August 1975 and May 1979 issues of *Acts & Facts*. They have been used widely and verbatim all over the country and have had some success in places like Columbus, Ohio; Dallas, Texas; and Anderson, South Carolina. They were even used in drafting the recent Georgia bill. The 1975 *Acts & Facts*, however, recommends a bit of secrecy as to the source of the legal wording, saying "it would be better not to mention ICR at all in connection with it [the resolution], so that the officials will realize that it is their own constituents who are concerned with the issue."

What this boils down to is an ICR engineered local grass roots pressure movement to sneak creationism into the schools through every back door they can find. But, failing that, they will settle for the intimidation caused in their wake, knowing full well that such intimidation tends to prevent, or water down, the teaching of evolution.

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Conclusion

It should be clear by now that, legally, the creationists do not have a case. Any effort to ban evolution because it conflicts with a religion is an effort to bring sectarian religious prohibitions into the public schools. This is unconstitutional. On the other hand, any effort to *add creationism* to the science curriculum will amount to the teaching of sectarian *doctrines*. This too would be unconstitutional.

To get around this problem, creationists have sought to establish creationism as secular science. They have gathered data and tried to remove references to the Bible. But, because they have made little effort to work through the scientific community, to participate in the peer review of the journals, to do more than just token field research; and since they have promoted a rather dogmatic "science," the courts have exposed this effort to be a sham.

Yet even if they *had* become truly secular in their ideas, mandating inclusion of these through legislation would remain illegal and contrary to academic freedom. Even *evolution* can't be forced in this way. It is not the business of the legislature to determine what is and is not science. This task belongs to the scientific community. Therefore, only if there is a legitimate controversy among knowledgeable field workers on an issue is it proper for more than one model to be taught. Since there is no such controversy at this time, creationism is without academic grounds for inclusion (except, perhaps, as a discredited theory in the same class as Lamarkianism).

This realization has forced creationists to try another ploy: If you can't join them, beat them — that is, ban *all* discussions of origins from the science curriculum, and send them off to the philosophy department.

Of course there's no need to ban creationism. It isn't part of the curriculum. And if it's proposed that we ban evolution, we're headed for another Scopes trial. We must therefore ask creationists *why* they want it banned. If it's because it conflicts with their religion, the constitution will prohibit such a move. But if it's because evolution is *itself* supposedly a religion, they will have to prove that. And they will have to prove it using scientific means, submitting their arguments to peer review, and actually showing that evolution is untestable and non-scientific in nature.

Because of the difficulty of this endeavor, and because they cannot win in the courts, some creationist groups have given up legal action altogether and have emphasized a kind of "religious smuggling." One part of their plan involves telling school officials that the two-model approach is both constitutional and scientific, even though creationists have never won a court case or convinced a scientific symposium. Another part involves gathering pressure groups to intimidate school authorities so evolution can be pulled out, or creation brought in, through the back door. (In such cases, it should occur to school authorities to ask why pressure is necessary if creationism is scientifically sound, and why ICR

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has avoided the courts if their position is supposed to be constitutional.)

So far, not having a good case hasn't been fatal to the creationists. In fact they have flourished! — which shows that the problem will be with us a long time. Obviously it isn't enough for evolutionists to have the law on their side, to sit back and let the lawyers do the work. Creationists have been losing the battles and winning the war. That is, they have successfully intimidated the schools and textbook publishers into near submission. This has effectively won them the Scopes trial. With their continued persistence, and with further neglect by evolutionists, they may, through their "guerrilla warfare," succeed in their primary goal of getting Biblical fundamentalism taught in our public schools.

Meanwhile, their constant battling costs the taxpayers money and gains them the supporters they need. As a result, in time they could feel confident enough to push for a constitutional amendment that would turn the legal case around in their favor.

Because it isn't safe to neglect this threat any longer, the time has come to inform the public of the facts — and to guarantee students an adequate education. Respect for science in America is waning. The popularity of both creationism and mysticism are symptomatic of it. It's no longer possible for academics to ignore the public while advancing their scientific careers. If they try, they will soon find creationism in the schools and anti-science in the electorate.

The public never fully accepted evolution. Now that we realize this, we can work to remedy the situation. We can study the creationist agruments to learn where evolution is being misunderstood or feared. We can then tell the public *why* scientists accept evolution, instead of telling them merely *that* they do. We can improve the public relations of science in general, and thereby bring it back into respect. But, most importantly, we can update Muller's statement and boldly declare, "One hundred twenty-two years without Darwin *are* enough!"

In a future issue, **PART 2. The Educational Issues.** Watch for it.

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THE FATAL FLAWS OF FLOOD GEOLOGY

by Christopher Gregory Weber

The flood geology theory teaches essentially that the Biblical Flood of Noah buried all the fossils within a year's time, several thousand years ago. Although this theory accepts each miracle explicitly mentioned in the Biblical Flood story, the Institute for Creation Research (ICR) maintains that God uses miracles very sparingly; once He finished using a few miracles to get the Flood rolling, He let it operate according to natural laws to produce the geological features that are now seen in the earth's crust. This part of their version of the flood geology theory purports to explain the structure of the rocks in the crust, and thus makes testable scientific predictions: wherever this theory is naturalistic, it is a scientific theory deserving a scientific response.

The Great Deluge

The ICR flood geology theory relates the events of the Biblical Flood as follows: Before the Flood, a water vapor "canopy" in the upper atmosphere created a greenhouse effect, making the entire earth a tropical paradise. The oceans were shallower, the lands lower and more extensive than today. Because the greenhouse effect kept temperatures the same throughout the earth, there was no wind circulation and no rain, only a mist that watered the ground daily. Underneath the earth lay vast underground water reservoirs.

To start the Flood, God performed some miracles: He made the animals seek out Noah's Ark, "opened the windows of the heavens" to empty the vapor canopy on to the earth, and "broke the fountains of the great deep" to overwhelm the continents with volcanically heated brines. During the course of the flood, the violence of the rains and volcanic waters catastrophically scoured and dumped sediments, burying all sorts of creatures as fossils in the process. *In and of itself*, this catastrophic erosion and sedimentation was perfectly naturalistic; it operated according to ordinary laws of physics and chemistry, only on a much larger and faster scale than erosion and sedimentation today.

One year later, to end the Flood, God performed one more set of miracles; he made the continents rise and the ocean basins sink along vertical faults. These new basins were necessary to contain all the ocean waters once they had been augmented with all the newly released canopy and subterranean waters. Thus ended the Flood of Noah; thus originated the face of the earth we see today.

Modern creationists no longer calculate precise Biblical chronologies because they say there may be small gaps in some of them. Even so, they believe that

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God created the earth no earlier than ten thousand years ago, and brought on the Flood one or two thousand years after the Creation.

This account summarizes the flood geology model that Dr. Henry M. Morris, Director of ICR, expounds and defends in creationist classics like *The Genesis Flood* (Whitcomb and Morris, 1961) and *Scientific Creationism* (1974).

Despite all the miracles in the Biblical Flood story, the ICR members emphasize that their flood geology model is mostly naturalistic. They claim that this model can interpret the known geological evidence in terms of known laws of physics and chemistry better than does orthodox geology. For instance, John C. Whitcomb in *The World That Perished* (1973) tells us that:

> God maintains a definite *economy of miracles*. Otherwise, miracles would become commonplace and would thus lose their uniqueness and significance. . . . Apart from the specific miracles mentioned in Scripture, which were necessary to begin and to terminate this period of global judgment, the Flood accomplished its work of destruction by *purely natural processes* that are capable of being studied to a certain extent in hydraulics laboratories and in local flood situations today. [pp. 67 - 68; emphasis Whitcomb's]

Thus Whitcomb, as well as his friend Dr. Morris (who wrote an enthusiastic foreword for the book quoted above) commits himself to explaining the bulk of the geological evidence naturalistically. How well do they succeed? This article can scarcely cover all relevant evidence, but it will nevertheless tackle this question.

Let's begin with the problems posed by fossil desert deposits.

Desert Deposits

You don't need a Ph.D. in geology to know that desert dunes and other desert deposits do not form under roaring flood waters. These require not only time, but also dry land. The Flood of Noah supplies neither.

The Old Red Sandstone, which looks for all the world like a collection of fossilized desert dunes, was formed in Devonian times. It has outcrops extending from the British Isles to Poland and Russia's White Sea, and from Germany to Norway (Gilluly, Waters, and Woodford, 1968). Outcrops have even been found in Greenland and North America. In Devonian times, before North America and Europe drifted apart, these dunes covered an entire semi-arid continent.

Several lines of evidence derived from this great geologic formation create difficulties for the flood geology model. For instance, the interfingering of these sandstones with marine sediments shows that the shoreline of this continent advanced and retreated several times. Thus the desert rocks are entangled with rocks that the flood geology model says were formed within the one-year-long flood. Also, redbeds, consisting partly of rust formed above sea level, are also

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found in this formation. These would not have been formed in any catastrophic flood. The Old Red Sandstones also contain typical playas, complete with their characteristic cubic salt crystal deposits. These are desert salt-pan deposits formed after the rainy-season lakes evaporate. Today, in the Mojave Desert, playas can become lakes for a couple of weeks, only to dry out again, leaving a crust of salt deposits like those found in the Red Sandstone. Although a few freshwater ponds did exist on this ancient semi-arid continent, they dried up from time to time. So, we find fossil mud cracks in the shales that came from the dried-up pond bottoms, and we find fossil lungfish, a type of fish that can survive drought by building a mud cocoon in the pond bottom and breathing air. Hundreds of square miles of fossil sand dunes in these deposits contain cross-bedding and sand-blasted pebbles (ventifacts) of the sort found in modern desert sand dunes, and in no other kind of modern sediment. These different independent lines of evidence converge to show that the Old Red Sandstones almost certainly formed over thousands of years in a dry climate, not in any kind of flood catastrophe.

The Grand Canyon contains fossil desert dunes and other sediments that to all appearances were deposited on dry land. The Permian Coconino Sandstones in the upper walls of the Grand Canyon have the frosted well-sorted well-rounded sand grains found only in land-deposited sand dunes (Shelton, 1966). Furthermore, many of the laminae of the cross-bedding contain fossil footprints that could only have come from reptiles or other quadrupeds climbing up the face of a slightly damp sand dune in the open air. (Those climbing *down* the slopes left no tracks because they simply slid.) ICR geologist Dr. Steve Austin has taught the theory that amphibians resting between underwater dunes made the tracks. His theory is very interesting, but rather implausible since the Flood must have been violently dumping several meters' worth of sediment per day.

The Canyon's Supai and Hermit Shales, found today beneath the Coconino Sandstones, look exactly like river deltas that formed above sea level (Shelton, 1966). Back in Permian times, many quadrupeds (probably reptiles) left their footprints in the soft delta mud. As the mud baked hard in the sun, it formed cracks. The hardness of the baked mud preserved the footprints and mudcracks until the flooded rivers of the rainy season buried them in fresh mud. These fossil prints and mudcracks are found today, as well as iron oxides that form in the open air, showing that these shales formed above sea level.

The pure quarz Navajo Sandstones of Triassic and Jurassic times in Zion National Park, Utah, also look exactly like desert sand dunes (Gilluly, Waters, and Woodford, 1968). They contain extensive cross bedding of the type found in sand dunes, and the frosted sand grains and sand-blasted pebbles found only in dunes formed on the land.

Certain formations in western Wyoming look exactly like deserts that bordered a fitfully receding sea in Carboniferous times (Houlik, 1973). In particular, the Mississippian Lodgepole Formation contains the type of carbonate

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deposits and evaporites found forming in tidal flats today. The Amsden formation consists of sabkhas and desert dunes. Sabkhas are a kind of hardpan that forms in deserts after hard water seeps up through the ground by capillary action and evaporates leaving nodules of calcite, andhydrite, and other salts. They are seen forming extensively in Saudi Arabia today. Unless Houlik has grossly erred, these sabkhas, casts of evaporite crystals, and fossil dunes show that these Carboniferous deposits formed in a desert, not a flood.

Several times at the end of the Miocene epoch (six to eight million years ago), the Mediterranean Sea dried up, leaving extensive desert deposits on the sea bottom (Hsu, 1972). The Straits of Gibraltar opened and closed, causing these complex changes, as the *Glomar Challenger* discovered in 1970 by using echo soundings and deep-sea core samples. Each time the Mediterranean slowly dried up, first calcite precipitated around the rim of the basin of the Balearic abyssal plain, then anhydrites and gypsum further in, and finally rock salt in the center at the deepest point. This is just the order that these salts would precipitate if you set out a large saucer of sea water to dry. Successive dryings of the Mediterranean produced hundreds of meters of evaporites. Not only did evaporites form, but also land deposits like sun-baked mud cracks, wind-blown sand, and sabkha anhydrite nodules. Since algae can only grow where sunlight reaches, the stromatolites (a common algae deposit) found in deep sea core samples show that the Mediterranean sea floor, now two miles deep, was once dry land. The Rhone and Nile rivers cut their canyons thousands of feet below current sea level to feed the dessicated Mediterranean basin. Desert-style alluvial fans accumulated from debris washed by cloudbursts down the slopes of Sardinia; now these deposits lie far under the water. After the Mediterranean refilled with water for the last time, at the beginning of the Pliocene, sediments began to accumulate over the evaporites; the weight of these sediments forced evaporites up through weak spots in the sediments to form salt domes. Some of these salt domes are a few miles across, and hundreds to thousands of feet high. Even though such structures may not be forming today, a dried-up Mediterranean could have easily formed them, whereas flood geology is hard pressed to account for such things.

Fossil Forests

In Yellowstone Park at Specimen Ridge, a nearby volcano buried 27 forests one atop the other in rocky debris in Eocene times. After a forest grew on top of some old volcanic debris, the volcano would shower fresh debris through the air on top of it and mudslides consisting of volcanic debris would flow through it. The trunks and branches left sticking above the volcanic debris rotted away. Then a new forest would grow on top all this new debris, repeating the cycle. Animal fossils are scarce because the animals living in the forests fled the area as soon as the volcanic dust made the air hard to breathe. However, the falling debris, which broke the branches off the trunks, preserved many fossil leaves and

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twigs (conifers, deciduous trees, and ferns). As the rock erodes today, the petrified trees (which erode more slowly) stand upright and project above the ground. Complete root systems have been found in many of these trees. This entire deposit took over 20,000 years to form, double the maximum age of the earth allowed by ICR, and 20,000 times too long to fit into the Flood of Noah.

Erling Dorf (1964) has calculated all this. He noted that the oldest trees in each layer were about 500 years old when they were buried. Igneous rock requires 200 years to decay into a reasonable soil. Add these two figures, and we get the age per layer; multiply by 27 layers, and we get about 20,000 years, the *minimum* time in which a formation like this can arise.

Flood geologists, on the other hand, insist that Noah's Flood washed in heaps of uprooted trees between eruptions; they say the trees stand upright because dirt which became entangled in the roots weighted down the bottoms enough to hold the trunks upright. Nevertheless, uprooted trees today that wash onto a beach lie on their sides. F. H. Knowlton (1914), referring to a 12-foot-tall 26½-foot-around fossil redwood, says, "The roots, which are as large as the roots of ordinary trees, are now embedded in solid rock." William B. Sanborn (1951) says concerning two nearby pines, "Each stands about 15 feet, and shows a complete root system." Charles H. Brown (1961) says that one of the methods of finding exact forest levels was to find "the expansion of the base of an upright tree trunk immediately above the root system." One would expect the trees to be stripped of most of their roots and buried on their sides if they had been uprooted and buried in Noah's Flood.

In an article in some obscure religious journal cited in Robert Kofahl's *Handy Dandy Evolution Refuter*, flood geologist Harry Coffin maintains that the tree rings within a given fossil forest layer do not cross correlate. Let's look into this.

Every year, a tree grows a new ring. If the rainfall varies from year to year where this tree grows, then all the rings in its wood will vary in diameter; the narrow rings grew during the dry years, and the wide ones during wet years. Dendrochronologists (tree-ring daters) correlate tree rings from different trees by comparing ring variation patterns in one tree with those in another to see whether they match.

Since Coffin says the petrified trees of Specimen Ridge have rings that vary enough in diameter to be worth trying to correlate, he implies that before the Flood, rainfall varied from year to year. In this, he contradicts the flood geology model without knowing it (if he assumes with Morris that no rain fell in pre Flood times). Also, since the trees all supposedly died within the same year in the Flood, the flood geology theory implies that if their rings vary in diameter at all, then *all* the trees *everywhere in the formation* should cross-correlate. Thus Coffin's claims do not stand up under analysis.

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The Earth's Crust

Flood geologists claim that the ocean basins and the continents consist of essentially the same sort of crust; the main difference is that the ocean basins were lowered and continents raised along vertical faults. Their theory creates two problems.

Firstly, if the Flood washed over entire continents, then most of the sediments and sedimentary rocks of the world would be found in the ocean basins. The eastern Washington Scablands show (on a small scale) what the continents should look like if flood geology is true (Shelton, 1966). During the last ice age, a glacier dammed up a lake called Lake Missoula. When that dam melted, 2,000 cubic kilometers of lake water catastrophically denuded thousands of square kilometers of eastern Washington. However, similar denuded igneous rocks are seldom found outside of Washington State. On the contrary, the continents and continental shelves are covered as much as 12,000 meters deep with sediments and sedimentary rock, whereas ocean basins always bear less (usually far less) than a kilometer of sediment except where they abut a continental shelf. The continental shelves gather most of the sediments dumped by rivers. Few sediments ever get to the deep ocean basins beyond. The continental drift theory leads us to expect exactly this result, as any good encyclopedia will show. However, it is exactly the reverse of what flood geology predicts.

Secondly, the continents are mostly slabs of granite about 30 to 60 kilometers thick. The granitic continental crust stands higher above the ocean basins while having roots more deeply sunk than those of the ocean basins because granite is lighter than basalt, and hence "floats" more buoyantly upon the viscous mantle of the earth. These facts about sediments and buoyancy, well known to any freshman geology student, cause grave difficulties for flood geology.

Coral Reefs

Huge coral atolls and reefs require many thousands of years to form because the individual corals that constitute them grow so slowly. Under ideal conditions, corals grow as fast as 1.0 to 2.5 centimeters per year, but conditions are seldom ideal, and reefs as a whole grow much more slowly than the individual corals that make them up. The surf pounds broken coral branches into sand, and the red and green calcareous algae cement this sand together into a form far more compact than the original corals, so a reef complex consisting largely of cemented coral sand actually grows much more slowly than the original corals, only millimeters per year. Such slow growth rates imply that coral atolls and barrier reefs (both fossil and modern) needed tens of thousands of years to grow into their present form; the flood geology model supplies only a fraction of the needed time. The modern Eniwetok atoll, the fossil Rainbow Lake reefs, and the

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complex geology of Hawaii are good examples to illustrate this.

H. S. Ladd (1960) has drilled deep holes on Eniwetok atoll to take samples of coral and coral derived rock. These core samples reveal a huge cap of coral that took millions of years to form. Over a thousand cubic kilometers of coral reef rock cover a sunken basalt volcano cone. Millions of years ago, this cone formed a volcanic island; the parts above sea level were worn flat by erosion. As it slowly sank, the coral reefs that had been growing on its rim grew upwards fast enough to keep at the surface of the ocean, forming a huge coral cap. The cores taken from the drilling show that the deepest corals are so old that they have become chemically altered from aragonite to dolomite. Occasionally in geological history, the volcano temporarily ceased to sink, and lifted the coral cap many feet above sea level (the modern Tonga islands are also former atolls heaved many feet above sea level); the core samples clearly show gaps in the coral where the coral was being weathered above sea level. The deepest core sample of all revealed coral as thick as 1380 meters. Assuming that Ladd is accurate, let us grant ICR two generous assumptions: (1) the reef as a whole grows a centimeter per year, and (2) we ignore the time represented by erosional gaps. Given these assumptions, the atoll must be *no less* than 138,000 years old.

The flood geology theory allows no more than about 8,000 years for all modern reefs to form, only 5% of the time that Eniwetok needed to grow to its present state. If flood geology is true, then the modern reefs started growing only after Noah's Flood was over with. After all, the Flood itself would have killed off all corals by kicking up a slurry of clay particles in all the ocean waters. These particles would have taken years to settle out. Corals require clear water and cannot stand any turbidity. Even though modern creationists allow gaps in the Biblical genealogies, standard ICR works like *Scientific Creationism* (General Edition) allow no more than several thousand years between Noah's Flood and today. To fit Eniwetok into their time constraints, the ICR creationists are forced to ignore the findings of Ladd.

The fossil Rainbow Lake reefs formed in Devonian times where Alberta, British Columbia, and the Northwest Territories meet. As Hriskevich (1970), Langton (1968), and others show, these reefs trap important oil reserves. Since they are buried in and intertongue with other sedimentary rocks, they must have formed in the Flood of Noah, if flood geology is true. Nevertheless, they form solid winding barrier reefs consisting of intergrown dolomitized coral and coral-derived debris glued together by calcareous algae. In other words, they look just like modern barrier reefs, not like piles of loose coral that the tidal waves of Noah's Flood threw together by chance. One reef is over 240 meters thick. Unless petroleum geologists have grossly erred somehow, we calculate, using the generous growth rate of a centimeter per year, that this reef required 24,000 years of clear tranquil tropical surf to form, not a one year succession of muddy tidal waves.

If Harold T. Stearns' *Geology of the State of Hawaii* (1966) is correct, then

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the many coral reefs and other complex geological features of Hawaii form grave difficulties for flood geology. For instance, a strata sequence exposed at sea level near Pearl Harbor (illustrated on page 84 of Stearns' work) took many years to form, far too long for the Flood. This sequence contains reef limestone above sea level, which covers volcanic ash that had buried trees growing in place, which in turn covers another layer of reef limestone. Also, on page 21, Stearns describes a core sample taken from a hole drilled 332 meters into the ground somewhere else in Pearl Harbor. This sample revealed 15 coral reefs separated by fossil soils, lignite (brown coal), and beach rock. Stearns' example of ocean terraces will require some explanation.

Stacked above and below each other, ocean terraces look like steps in a staircase leading out of the sea. Each terrace represents an old shore line above or below current sea level; as the land and sea rise and fall, the surf cuts terraces at the different sea levels. Elevated and submerged terraces in Hawaii, New Guinea, Jamaica, and other tropical seacoasts often bear dead coral reefs (Goreau, 1979). Since many of these reefs took thousands of years to form, and since different terraces formed at different times, the stack as a whole took at least several times as long to form. Recorded history (which begins only a couple thousand years after the alleged Flood) knows no sea level changes amounting to hundreds of feet, so these terraces do not seem to fit very well into the post-Flood period. These terraces look exactly like the kinds of reefs and beaches forming today, not like debris thrown together in some catastrophe like the Flood of Noah.

Stearns, reporting about the coral-bearing terraces of Hawaii in some detail, points out that many terraces contain fossil-bearing marine conglomerates. To the orthodox geologist, this is no surprise; river floods, land slides, storm waves, and turbidity flows are only a few of the processes known to bury and preserve animals and plants before they rot away so they can become fossils. However, the ICR creationists insist that no processes except for catastrophes the size of Noah's Flood can bury dead animals fast enough to fossilize. If this theory is correct, and if these conglomerates were formed in the Flood, then the ICR creationists need to explain why these terraces look for all the world like the kinds of reefs and beaches forming by slow processes today.

Evaporites and Shales

Several lines of evidence show that fine-grained evenly-layered shales and evaporites require many thousands of years to form. Extremely fine sediment particles suspended in water settle to the bottom painfully slowly, and even slight turbulence keeps them in suspension. If you shake a jar full of dirt and water, the water will remain cloudy with clay particles long after the sand has settled out. Not only that, but the concentration of gypsum, calcite, and other dissolved salts in sea water is so low that thousands of cubic kilometers of sea

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water would have to evaporate to precipitate these salts as a typical evaporite deposit. These processes of sedimentation and evaporation are so slow that thick shale and evaporite deposits could scarcely have formed overnight. Since the flood geology model requires that all sedimentary rocks be deposited within one year during the Flood of Noah, the ICR creationists must somehow explain these facts away.

One way they might try would be to suggest that shale-forming clay would settle rapidly out of the flood waters if those waters were supersaturated with clay. ICR has already proposed (quoting Soviet geologist V. I. Sozansky) that evaporites formed rapidly from supersaturated volcanic waters. However, if either of these two theories are true, then thin even laminations extending over many square kilometers are an insoluble problem. The clays and evaporites would have almost certainly settled out in huge globs to form amorphous strata-free rock. The ICR theory that the laminations were caused by a rapid succession of turbidity flows does not satisfactorily explain how the fine stratification of the Green River shales or the Castilian evaporites could form in a one-year-long catastrophic flood. Let us discuss these two formations in more detail.

The finely stratified Green River shales of Wyoming, Colorado, and Utah are 600 meters thick. They accumulated at the bottom of a 30-meter-deep lake in Eocene times over a period of 5 to 8 million years (Bradley, 1929). Several lines of evidence show that each distinctly visible layer is a yearly deposit or "varve." The sedimentary deposits varied so much with the seasons that each varve clearly stands out. The average varve in this formation consists of a layer of clean microscopic clay particles alternating with a layer of hydrocarbons in the form of waxy pollen and spore particles (Clark and Stearn, 1958). Apparently, the spring wind and rivers wafted spores and pollen to the middle of the lake, but during the rest of the year, the currents were too weak to carry anything but the finest clay to the center of the lake. In the varves of some of the near-shore limey sandstones in the formation, the sediment particles gradually decrease in size from 0.02 mm at the bottom of the varve to 0.006 mm at the top (Bradley, 1929). The width of the Green River varves varies in cycles of 11½ years, 50 years, and 12,000 years, all superimposed on one another. The 11½ - year cycle corresponds to the sunspot cycle, the 12,000-year cycle to the precession of the equinoxes. Both these processes affected the yearly rainfall, and hence affected the width of each varve. Bradley's concession that he cannot explain the 50-year cycle shows that he was not imagining these cycles. The same kinds of varves are forming today in Sakski Lake (Crimea), Lake Zurich (Switzerland), and Lake McKay (Ottawa, Canada). Only slow processes happening over many years can account for varve formation. Even if an occasional storm did stir up the sediments on the bottom, the sediments could not have settled out so evenly unless the tranquil time intervals between storms were very very long and convective currents were largely absent.

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Creationists (like Whitcomb and Morris, 1961) have argued against the varve interpretation of the Green River shales by citing the beautiful fish fossils it contains. Supposedly, about 200 years' worth of sediment would have to accumulate to bury one dead fish, and by that time the fish would have long rotted away. However, the precipitates found in this formation show that the lake bottom was unusually alkaline (Press and Siever, 1974). Some shallow lakes in Florida today contain algal oozes that do not decay as long as no oxygen gets into them (Bradley, 1929). Under such circumstances, fossilization would be no surprise.

Since there are no huge evaporite deposits forming today, geologists have debated the precise mechanism by which they formed in the geological past. This gives many creationists the excuse not only to reject the traditional lagoon model of evaporite formation, but also to cite the authority of Soviet geologist V. I. Sozansky as long as his theories seem to support flood geology. Actually, Sozansky's article implicitly contradicts the flood geology model in a couple of particulars — and other geologists have come up with models that explain the observed evidence more easily than the traditional theory, Sozansky's theory, or the ICR theory.

The traditional evaporite theory states that evaporites formed in shallow lagoons in arid areas connected with the open ocean by only a narrow strait. As the water in the lagoon evaporated, precipitating salts in the process, water from the open ocean coming through the strait replaced it. But as the lagoon became more restricted and briney, first calcium carbonate ($CaCO_3$) would precipitate out as aragonite or calcite (limestone), and then calcium sulfate ($CaSO_4$) would precipitate out as gypsum or anhydrite, and finally, rock salt (NaCl) would precipitate out. If rain diluted the brines of the lagoon every rainy season, then a varve of carbonate (rainy season) and anhydrite (dry season) might form every year. This model accounts well for small evaporite deposits forming today, but not for the big ones that formed in the geological past.

Sloss (1969) modifies the traditional lagoon theory. He argues from the results of his experiments that evaporites formed from layers of water of different concentrations (ordinary sea water at the surface, highly concentrated brines on the bottom) that existed in a huge lagoon all at the same time. Schmaltz (1969) argues that huge evaporite deposits like the Castilian evaporites of Texas (450 meters thick and 20,000 square kilometers in area) and the Zechstein evaporites of Germany (600 meters thick) formed in deep basins like the Mediterranean Sea or Red Sea. If the straits connecting these modern seas with the open ocean were much shallower and narrower, then they would start depositing evaporites just like these ancient evaporites. His complex theoretical model explains in detail how several cycles of evaporite deposits separated by deep-ocean mud formed in the Zechstein evaporites of Schleswig-Holstein. It also explains the 1000 meters of evaporites now buried under deep-sea sediments at the bottom of the Gulf of Mexico. At the end of the Cretaceous

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when it first formed, the deep Gulf of Mexico basin was joined to the open ocean only by a narrow strait. Schmaltz's model predicts that the evaporites will be reasonably pure and free of other sediments because the river-deposited sediments would be deposited close to shore. These more recent theories explain all the evidence well using everyday laws of physics and chemistry.

The varves of the Castilian evaporites of Permian times in Texas (just like the Zechstein evaporites) are the strongest evidence that these evaporites took hundreds of thousands of years to form. These varves consist of calcite alternating with anhydrite (Anderson, 1972). In both examples, the calcite contains a lot of plankton and organic matter: fusulinids, possibly some algae, and possibly some shells. Even though mobile living things would swim away from the inhospitable brines, at least some plankton got pickled to death and fossilized. Many of the varves in this formation extend as far as 110 kilometers. Although Anderson insists that the yearly varve interpretation is not proved beyond all doubt, he adds that no one has yet suggested a better interpretation. The concentration of the brines never could have fluctuated many thousands of times during the one-year Flood to precipitate such fine yet extensive alternating layers of calcite and anhydrite. So many cubic miles of such microscopic crystals never could have settled out of the water in such even layers, all within a year's time. Since this formation contains over 260,000 couplets of thin calcite/anhydrite layers, the entire formation probably took 260,000 years to form.

ICR creationists who cite Sozansky's article to buttress flood geology have failed to account for his factual errors or for his statements that implicitly contradict their theory. In essence, Sozansky believes that the great evaporite deposits of the earth formed from volcanically heated brines erupting out of the ocean floor. He feels that the traditional lagoon model works fine for small modern deposits, but not for evaporites like the huge Castilian deposits. He argues that evaporites from such lagoons would contain fossils and other organic matter. He cites as an example the evaporites forming today in the Gulf of Kara-Bogaz in the Caspian Sea. The salt concentration kills, pickles, and preserves fish long enough for them to become fossilized in the evaporite deposits. Since the huge ancient deposits are allegedly free of organic matter, plankton, and so forth, Sozansky concludes that they formed by some totally different process.

Of course, the creationists would like to prove that the evaporites were catastrophically deposited by volcanic brines during the one-year flood. It is no surprise, then, that *Scientific Creationism* insists that "the studies of the Russian geophysicist Sozansky" have "shown almost conclusively" that orthodox geology is in error. However, Sozansky is a doubtful ally. For one thing, even if his theory is true, the creationists must still explain away the varve evidence. Sozansky never explicitly accounts for the varves. He would have to assume that each varve came from one big eruption, and that the eruptions were separated by

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enough time to let the salt crystals settle. Also, as we have seen, the Castile evaporites *do* contain a lot of plankton and organic matter. Schmalz's deep-basin theory shows why it does not contain fossil fish graveyards like those of the Gulf of Kara-Bogaz. Even so, Anderson's discoveries of plankton in the Castilian deposits contradict Sozansky's assertions that the great evaporite deposits are free of organic matter. Finally, the ICR creationists have insisted that "The very existence of fossils, especially in large numbers, is evidence of catastrophism at least on a small scale." (*Scientific Creationism*, p. 100.) They insist that fossils are not forming today because only a violent catastrophe can bury plants and animals in mud before they rot away. The work just cited quotes Sozansky whenever his thesis seems to support ICR creationism, yet never ever even *mentions* Sozansky's fossil fish graveyard, much less refute it.

Fossil Species

According to the flood geology theory, all "kinds" of plants and animals alive today (not to mention dinosaurs and mammoths and other animals now extinct) lived on the earth before the flood. The Bible says Noah was to take specimens of *every* type of living air-breathing land animal aboard the Ark (Gen. 6:19-21; 7:2, 3, 8, 9, 15). Thus flood geology predicts that the fossil record should consist mostly of animal and plant species alive today. The extinct fossil species should be mostly delicate types sensitive to environment, because the Flood and the rugged conditions inside the Ark would have killed such creatures off. These predictions fit poorly with the available evidence.

George Gaylord Simpson (1967), world famous paleontologist, says that nearly all fossil species and genera are extinct today. Very few modern species or genera are found as fossils at all. Even so called "living fossils' like the crossopterygian (lobe finned) fish are no exception. The fossil Paleozoic eusthenopteron and the modern latimeria are both lobe-finned fish. However, the latimera resembles the eusthenopteron no more than I resemble a gorilla. The creationists have yet to answer this objection.

Many delicate species of animal survive today in spite of the predictions of the flood geology model. Creationists have not been able to explain the technology by which Noah kept delicate koala bears and marmosets alive on the Ark. Pupfish survived a divine cataclysm only to be threatened with extinction by man-made reservoirs. We already saw how the muddy flood waters would wipe out corals (not to mention many other forms of sea life). The creationists have to postulate so many miracles to keep these creatures alive through the Flood that it would be much simpler and easier for God to create them all from scratch again after the Flood, and just forget the floating zoo.

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Flood Geology Vs. Orthodox Geology

So far, we have covered a small sample of the many types of geological evidence that flood geology cannot easily explain. Personally, it persuades me that flood geology is totally erroneous. Nevertheless, ICR creationists are bound to argue, "So what if you evolutionists can come up with a few difficulties? There is no theory anywhere that is totally free of them. Besides, the problems with orthodox geology are far more serious than any of the real or imagined difficulties you can dream up against Biblical catastrophism. Can *you* explain how an even layer of sandstone, the Saint Peter Sandstone, which covers much of the United States, was formed? Can you explain how the fossils in the so-called 'Lewis Overthrust' got into the wrong order for evolution? The evolutionist excuse that the 'older' rocks were shoved on top of the 'younger' ones is lame because *Genesis Flood* and other creationist writings have conclusively proved that there is no trace of evidence that any sliding took place. Until you can answer these grave difficulties, how can I take your evolution theory seriously?"

Actually orthodox geology has no such difficulties. Creationists misunderstand the nature of sedimentary facies, and there is plenty of physical evidence having nothing to do with fossils that the Lewis Overthrust is genuine. Creationists often quote their sources badly out of context, sources that prove thrust faulting is very real.

But, it will have to be the task of a future article to investigate these and other alleged difficulties in detail. For now, it is sufficient to say there are fatal flaws in the creationist flood geology model, flaws that render it inadequate to scientifically support the Flood or tell us anything about the age of the earth.

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BOOK REVIEW

Biology: A Search for Order in Complexity. Edited by John N. Moore and Harold S. Slusher. Zondervan Publishing House: Grand Rapids, 1974 (Revised).

Reviewed by William Thwaites.

The director of curriculum development at the Institute for Creation Research has publicly stated that this book is an embarrassment to many creationists because of the large number of errors it contains. Judging from this statement, we might expect it would soon be withdrawn from the market, thereby rendering any review unnecessary. It is my understanding, however, that such is not the case, and attempts are still being made to sell the text to private and public schools all over the country.

Well, errors or no, the book makes thoughtful reading for anyone interested in creationism and creationists — and that's where I come in.

As a practicing scientist I can hardly find fault with the oft stated purpose of the book — the exploration of alternative "models" to explain observed phenomena. This is, after all, a basic component of the scientific method. Too often, biology is presented as a series of conclusions with little or no attention given as to how those conclusions were reached. Certainly, the examination of data in the light of conflicting models *would* be an excellent approach for a biology text.

I might also compliment the editors with respect to the scope of the book. They have certainly included a wide range of material beyond the traditional discipline of biology. Paleontology, anthropology, radiometric dating, thermodynamics, molecular and population genetics, origin of life, and philosophy of science all seem to find their place. It would be difficult, therefore, to fault them for being too narrow in their coverage.

Unfortunately, the book misses the mark as to what science is all about. This fundamental misunderstanding is evident in the very first paragraph of the preface. There co-editor Moore unequivocally states that "true *science*" consists of presenting the raw data "*as it is.*" However, if the authors adhered to this ideal, they would present no models at all, a direct contradiction of their aforementioned purpose.

The real aim of the book seems to be the making of slanderous attacks on

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Dr. Thwaites, a geneticist at San Diego State University, teaches a special course, Evolution and Creation — Contrasting the Two Models, *with his colleague Frank Awbrey. They present the evidence for evolution in half the course time, and prominent creationists use the other half. The two have also teamed up in two public debates on the creation/evolution question, both times against representatives of the Institute for Creation Research.*

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evolution and evolutionists. I've looked in vain for one fair statement on the nature of evolution theory. Simply stated, the book is an attempt by the authors to get even for the omission of their creation theory in modern texts.

Furthermore, I am left with the impression that the authors, because they fully understand the extreme frailty of their model, have chosen to discredit evolution rather than make any case for creation.

A beautiful example of their subtle discrediting technique appears in their treatment of population genetics. This complex subject is incomprehensibly dispatched in slightly over one page. There is little chance that any reader not already acquainted with the subject would ever recognize he had just been treated to a fundamental theorem of the neo-Darwinian synthesis. It seems likely that any intelligent, but genetically naive, reader instead would dismiss population genetics as pseudoscientific double-talk, because that is exactly what page 119 contains.

In addition to muddling the facts, the authors make serious errors. For example, the letter "T" is used for both an allele symbol and an allele frequency with almost no mention of the midstream shift in meaning. Then the word "phenotype" is incorrectly used in place of "genotype." And just in case anyone were still comprehending after all of this, the derivation of the binomial distribution of genotypes in a population is erroneously said to be "from the results of a monohybrid cross."

Muddling and errors aside, however, the thing that really stands out is the fact that the authors rarely miss an opportunity to slander the intellect and intentions of evolutionists. Chapter 21, "Weaknesses of Geologic Evidence" seems to represent some sort of nadir in the employment of this technique, so let's take a look at it.

The mood of the entire chapter is captured exquisitely in the section, "Difficulties with the geologic timetable," (page 423). First the geologic sequence is said to be "artificial," and even the word "sequence" is placed in quotation marks along with the word "time." Then the reader is told that the order of the "sequence" was derived entirely by placing fossils in the order of increasing complexity so they would conform to evolutionary expectation. Nowhere is there a hint that the order of strata is usually pieced together by finding layers ABC in one place, BCDE in another, and EFG in still another, etc. Instead, we are told that the "geological column does not actually exist, but is an arbitrary system in the minds of geologists." The fact that no single locality shows *all* the strata is supposed, from the authors' view, to show the complete absurdity of the whole notion of the geological column.

On the following page we are told how index fossils are an example of circular reasoning. According to the creationists, the oldest strata are recognized as such because they have the least complicated fossils, while the youngest deposits are recognized by having the most complicated forms fossilized in them. The creationist catch-phrase goes like this: "Fossils date rocks and rocks

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date fossils."

As usual, there are several flaws in the creationist reasoning. So let's cover them one at a time. First, there is no known way of assigning a complexity index to any organism. So, if complexity were used to arrange the strata, the order of the geologic column would be a source of constant bickering among geologists. Such a method would have been thrown out as totally unworkable long ago.

Next, it is obvious that the strata could be ordered correctly even if the index fossils showed no apparent complexity gradient at all. What one would need to do is find an intact series, such as ABC, and then find a fossil type which was confined to the B stratum. The fossil used could have any apparent complexity, yet it would still allow you to recognize B strata wherever they occurred. The only assumption would be that the B-type fossil enjoyed wide distribution during one period of time. I fail to see any circularity in this assumption.

As far as assigning an order to any one sequence, only one more assumption would be needed. That would be that most deposits are found right-side-up. Fossil tracks, and burrows of bottom dwellers would also provide some indication as to whether any particular sequence was right-side-up. Tracks, for example, are usually pushed into the substratum, rather than pulled up from it.

At any rate, we see that creationist claims of circular reasoning are possibly pure subterfuge, or they may indicate an incredible lack of common sense on the part of the authors.

Of course the foregoing hypotheses are not mutually exclusive.

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Henry Morris, from *The Twilight of Evolution*, page 77.

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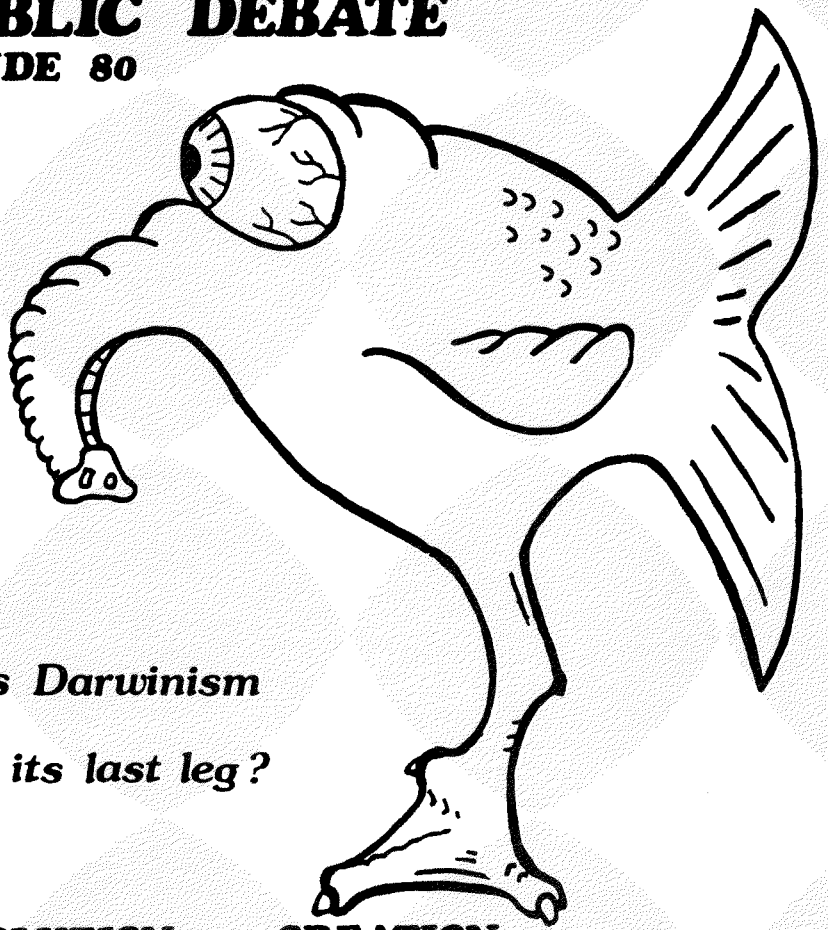

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